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**IN THE US PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of: Anderson

Group Art Unit: 2643

Application No: 09/515,776

Filed: February 29, 2000

For: Universal Four-Channel Surround
Sound Speaker System for Multimedia
Computer Audio Sub-systems

Examiner: Lao, Lun S.

Attorney Docket No.
1006-024/MMM

APPELLANT'S BRIEF (37 CFR 41.37)

COMMISSIONER FOR PATENTS
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This brief is in furtherance of the Notice of Appeal filed April 26, 2004, in connection with the captioned application. The \$320 fee required under 37 CFR 1.17(c) is enclosed herewith. An extension of time for 5 months to November 26, 2004 is requested.

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-02 FC:1401 -340.00 OP

Adjustment date: 12/07/2004 MBEYENE1
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CONTENTS

1. Real Party in Interest.....	3
2. Related Appeals and Interferences	3
3. Status of Claims.....	3
4. Status of Amendments	3
5. Summary of Claimed Subject Matter	3
7. Grounds of Rejection to be Reviewed on Appeal.....	13
8. Argument	13
9. Summary.....	19
10. Appendix A: The Claims Involved in the Appeal	20

1. Real Party in Interest

The real party in interest is Logitech Europe S.A. Romanel-sur-Morges, Switzerland, which owns assignee Labtec Corporation, Vancouver, Washington.

2. Related Appeals and Interferences

5 There are no related appeals or interferences.

3. Status of Claims

Claims 1-11 and 13-32 are on appeal and pending in the application.

4. Status of Amendments

No amendment was filed after the November 18, 2003 final rejection.

10 **5. Summary of Claimed Subject Matter**

a. Background of the Invention and Summary of the Prior Art

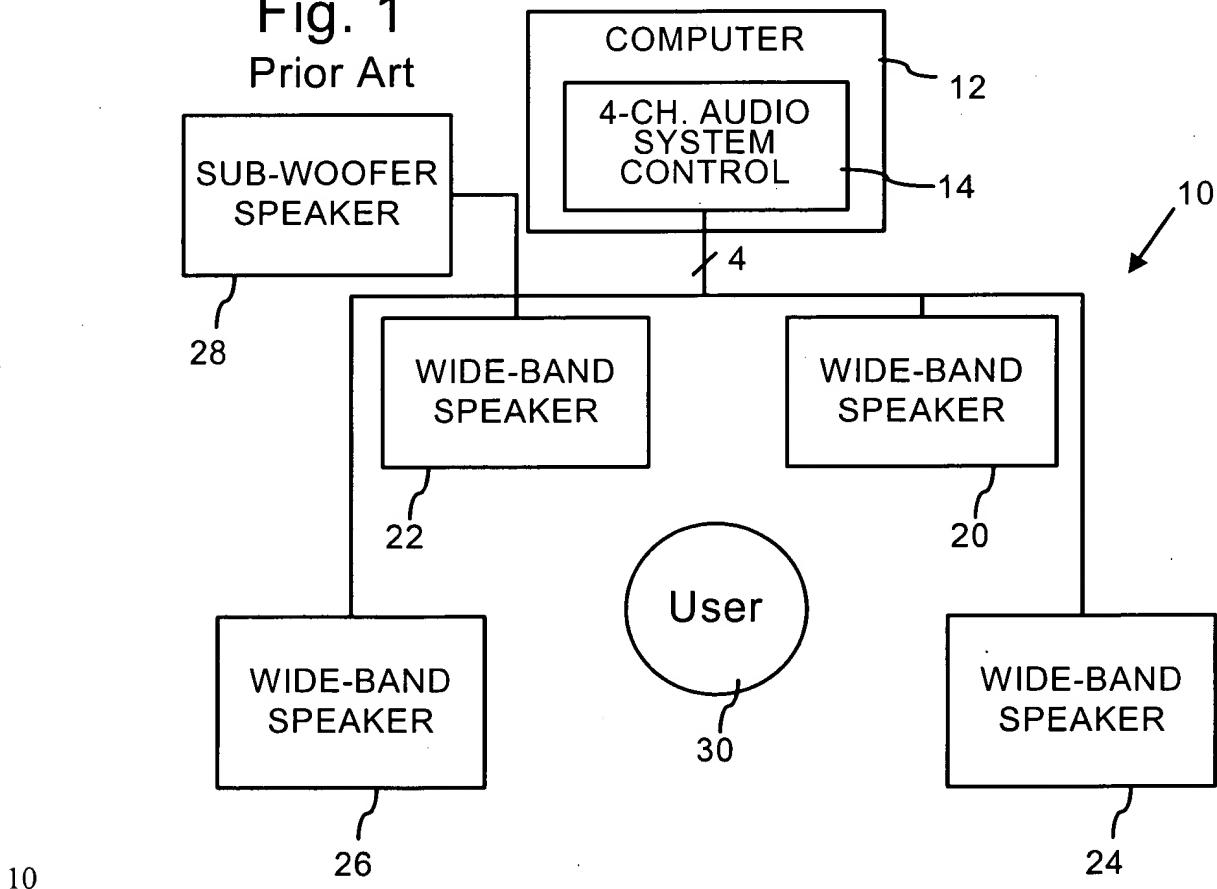
Speaker systems with integral amplification electronics provide simple, compact audio transducers for multimedia personal computers. These speaker systems, referred to herein as multimedia computer speaker systems, typically include pairs of wide-band

15 speaker drivers mounted in separate housings with amplification electronics incorporated into one or both housings. Because compactness is desirable, small, wide-band speaker drivers (e.g., 3-inch diameter cone speaker drivers) are commonly used.

Many conventional multimedia computers include two-channel (stereo) multimedia computer audio sub-systems. Typically, a conventional two-channel 20 multimedia computer audio sub-system includes a two-channel audio sub- system control circuit, which is commonly configured as a separate computer expansion board called a “sound card,” and two wide-band audio transducers or speakers. A sub-woofer audio transducer or speaker is also included in many implementations. Conventional two-channel audio sub-systems are configured to provide at the two wide-band speakers 25 distinct audio playback according to two distinct audio channels included in a multimedia computer work such as a game, music, etc.

Some multimedia computers include prior art four-channel multimedia computer audio sub-systems, sometimes called surround sound systems, environmental audio systems, or multi-channel audio systems. As illustrated in Fig. 1 (reproduced below), one prior art four-channel multimedia computer audio sub-system 10 includes a multimedia computer speaker system with four wide-band audio transducers or speakers 20, 22, 24, and 26, and a sub-woofer audio transducer or speaker 28. The four wide-band speakers 20, 22, 24, and 26 receive four different audio signals or channels. The four-channel multimedia computer audio sub-system 10 may include a two- or a four-channel audio - sub-system control circuit (e.g., sound card) 14.

Fig. 1
Prior Art



10

Some four-channel multimedia computer audio sub-systems include four-channel audio sub-system control circuits that are adapted for multimedia computer works with four distinct audio channels. The four distinct audio signals may be referred to as right front, right rear, left front, and left rear. A subwoofer audio signal is generally a summed and low-pass filtered combination of at least two of the four distinct audio channels.

In this type of system, the wide-band speakers are positioned to surround a user of a multimedia computer with two pairs of wide-band speakers, one pair in front of the user and a second pair behind the user. The sub-woofer generates audio outputs of such low frequencies that the user is unable to discern the direction of those sounds. As a result, 5 the positioning of the sub-woofer is generally arbitrary.

Earlier four-channel multimedia computer audio sub-systems were of the matrix-encoded type. Simple matrix-encoded four-channel multimedia computer audio sub-systems were sometimes adapted from a conventional two-channel stereo sub-system.

Front right and front left speakers would receive conventional right and left stereo audio 10 signals. Rear right and rear left speakers both would receive a difference (e.g., Right-Left) between the two stereo signals.

A disadvantage of such a simple matrix-encoded system is that the rear speakers receive the same audio signal (e.g., Right-Left), and the audio signal is asymmetric as to the right and left stereo audio signals. This can cause a user to perceive different sounds 15 as emanating from incongruous locations. (A user's perceptions of where sounds originate is sometimes called the sound image.)

For example, an audio signal that includes only right channel sound and no left channel sound would be played at the right front speaker and both rear speakers. These three speakers would form an audio image for the user that makes the sound seem to 20 come from behind and to the right of the user. An audio signal that includes only left channel sound and no right channel sound would be played at the left front speaker, and the inverse of the sound would be played at both rear speakers. These three speakers would form an audio image for the user that makes the sound seem to come from behind 25 and to the left of the user, but shifted because of the inverse left channel sounds played in the rear speakers. Such sound image incongruities are undesirable.

Another example of a four-channel multimedia computer audio sub-system is the DolbyTM surround encoding promulgated by Dolby Laboratories, Inc. This type of four-channel multimedia computer audio sub-system includes two matrix-encoded audio channels. A first channel includes a right-side audio channel, a center audio channel, and 30 a surround audio channel. A second channel includes a left-side audio channel, the center

audio channel, and the inverse of the surround audio channel. The first and second channels may be represented as:

Channel 1 = Right + Center - Surround

Channel 2 = Left + Center + Surround

5 In this type of system, Channel 1 and Channel 2 function as the right- and left-side audio channels that are applied to wide-band speakers that are positioned to the respective right and left of the user. A Center audio channel corresponds to a wide-band speaker that is positioned centrally in front of the user and is decoded as the sum of the Channel 1 and Channel 2 signals, resulting in the Center audio channel including the
10 following audio components:

Right + Left + 2Center.

A Surround audio channel corresponds to a wide-band speaker that is positioned centrally behind the user and is decoded as the difference of the Channel 1 and Channel 2 signals, resulting in the Surround audio channel including the following audio components:

15 Right – Left + 2 Surround

A disadvantage of such systems is that the Right, Left, Center, and Surround audio channels cannot be isolated from each other. In particular, the Right or Left channels cannot be separated from the Surround or Center Channels.

20 Most matrixed and distinct four-channel audio sub-systems are configured to provide at the wide-band speakers audio playback according to four distinct audio channels included in a multimedia computer work such as a game, music, etc. The four distinct audio channels provide a surround sound playback with acoustic characteristics that are perceptually enhanced beyond those of traditional stereophonic playback.

25 A vast majority of computers include audio sub-system control circuits (e.g., “sound cards”) that support only two audio channels (i.e., stereo). If a multimedia computer work having four distinct audio channels adapted to a four-channel audio sub-system is played on a conventional stereo audio sub-system control circuit, only two of the channels in the work will be played. Even if four speakers are driven by the conventional stereo audio sub-system control circuit, both right side speakers typically
30 will play the same right-side audio signal, and both left side speakers typically will play the same left-side audio signal. Similarly, if a multimedia computer work having four

matrixed audio channels (e.g., DolbyTM surround encoding) is played on a conventional stereo audio sub-system control circuit, only the two matrixed channels in the work will be played (e.g., Channel 1 and Channel 2). Even if four speakers are driven by the conventional stereo audio sub-system control circuit, both right side speakers typically 5 will play the same right-side audio signal, and both left side speakers typically will play the same left-side audio signal. The exception to this is if the multimedia computer speaker system contains a matrix decoding circuit such as the DolbyTM Surround decoder.

Accordingly, multimedia computer works having four distinct audio channels adapted to four-channel audio sub-systems provide no audio improvement when played 10 with conventional stereo audio sub-system control circuits. As a consequence, users having computer systems with conventional stereo audio sub-system control circuits enjoy no benefits from multimedia computer works (e.g., games) having four distinct or matrixed audio channels, and the market for such works remains correspondingly limited.

b. Concise Summary of the Present Invention

15 The present invention includes a universal four-channel multimedia computer speaker system that is connectable to audio sub-system control circuits (e.g., "sound cards") of both the four-channel type and the conventional two-channel (stereo) type. The universal four-channel multimedia computer speaker system provides an actual four-channel surround sound playback whenever such playback is supported by the audio sub- 20 system control circuit and a multimedia work with four distinct audio channels. If the audio sub-system control circuit or the multimedia work does not support four-channel surround sound playback for four distinct audio channels, the universal four-channel multimedia computer speaker system provides a proxy surround sound playback that simulates surround sound playback without suffering from incongruous sound image 25 artifacts characteristic of prior systems.

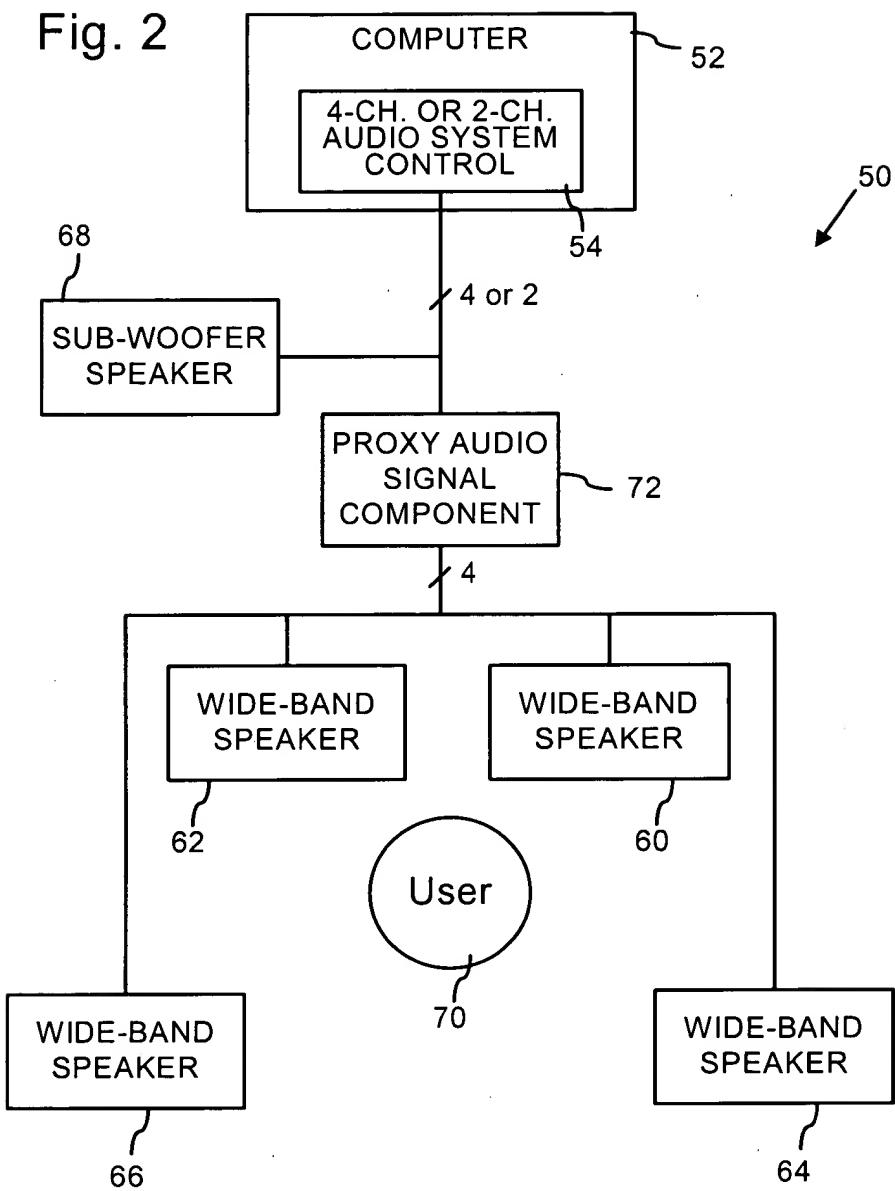
Fig. 2 (reproduced below) is a simplified block diagram of a universal four-channel multimedia computer speaker system 50 according to the present invention coupled to a computer 52 such as a personal computer. Four-channel computer speaker system 50 is connected to an audio sub-system control circuit 54, which is commonly 30 configured as a separate computer expansion board called a "sound card." It will be

appreciated, however, that audio sub-system control circuit 54 may alternatively be incorporated into other boards or systems within computer 52. Audio sub-system control circuit 54 may be either of a conventional two-channel (stereo) type or a four-channel type.

5 Universal four-channel computer speaker system 50 includes four wide-band audio transducers or speakers 60, 62, 64, and 66, and commonly a sub-woofer audio transducer or speaker 68. Wide-band speakers 60-66 are typically positioned to surround a user 70 of computer 52. For example, speakers 60 and 62 could be positioned in front of and to the respective right and left of user 70. Speakers 64 and 66 could be positioned
10 behind and to the respective right and left of user 70. As is common in the art, sub-woofer 68 generates audio outputs of such low frequencies that user 70 is unable to discern the direction of those sounds. As a result, the positioning of sub-woofer 68 is generally arbitrary. Speaker system 50 includes amplifiers for speakers 60-66 and sub-woofer 68, and optionally equalizers and a bass boost system, as are known in the art.

15

Fig. 2



Audio sub-system control circuit 54 may be either of a distinct four-channel type, such as audio sub-system control circuit 14, or a conventional two-channel (stereo) type.

5 With audio sub-system control circuit 54 of a distinct four-channel type, universal four-channel speaker system 50 is configured to provide at speakers 60-66 distinct audio playback according to four distinct audio channels in a four audio channel multimedia computer work such as a game, music, etc., as described above with reference to four-channel audio sub-system 10. In addition, universal four-channel speaker system 50

delivers a bass or sub-woofer audio signal to sub-woofer 68. In this configuration, universal four-channel speaker system 50 functions as a conventional four distinct channel multimedia computer surround sound audio system.

With audio sub-system control circuit 54 of a conventional two-channel (stereo) type, universal four-channel speaker system 50 is configured to provide at front speakers 60 and 62 distinct audio playback according to respective right-front and left-front audio channels in a four audio channel multimedia computer work such as a game, music, etc. or distinct audio playback according to respective right and left audio channels in a standard two-channel (stereo) audio multimedia computer work such as a game, music, etc. Universal four-channel speaker system 50 is configured to provide at rear speakers 64 and 66 distinct audio playback that is generated from the right-front and left-front audio channels in the four audio channel multimedia computer work or distinct audio playback that is generated from the right and left audio channels in the standard two-channel (stereo) multimedia computer work. In addition, universal four-channel speaker system 50 delivers a bass or sub-woofer audio signal to sub-woofer 68.

With audio sub-system control circuit 54 of a conventional two-channel (stereo) type, universal four-channel speaker system 50 operates with respect to front speakers 60 and 62 in the manner described above with reference to four-channel audio sub-system 10 for multimedia computer works with four distinct audio channels. With respect to rear speakers 64 and 66, universal four-channel speaker system 50 includes a proxy audio signal component 72 that provides respective right and left rear proxy audio signals to proximate the typical sound of actual right and left rear audio signals carried on a four audio channel multimedia computer work or simulated surround sound generated from conventional or matrix encoded two-channel (stereo) multimedia computer work.

In one implementation, proxy audio signal component 72 generates right and left rear proxy audio signals (R'_{REAR} , L'_{REAR}) as inverted differences between the right and left stereo audio signals (R_{STEREO} , L_{STEREO}). For example, the right and left rear proxy audio signals (R'_{REAR} , L'_{REAR}) may be generated according to the following equations:

$$R'_{REAR} = R_{STEREO} - L_{STEREO}$$

$$L'_{REAR} = L_{STEREO} - R_{STEREO}$$

The right and left rear proxy audio signals (R'_{REAR} , L'_{REAR}) are applied to to respective rear speakers (e.g., speakers 64 and 66).

c. Concise Explanation of the Subject Matter of Independent Claim 1

Referring to Fig. 2, claim 1 recites a universal four-channel multimedia computer speaker system 50 that is connectable to an audio sub-system control circuit 54 of a multimedia computer 52. The universal four-channel multimedia computer speaker system 50 includes four separately positionable audio speakers 60, 62, 64, and 66 and two pairs of inputs for receiving from the audio sub-system control circuit 54 at least a first one of two pairs of audio input signals. (App. page 9, lines 10-28.)

Referring to Fig. 3, outputs 90, 92 deliver distinct audio output signals to each of the four audio speakers 60-66, a first pair of the audio speakers (e.g., speakers 60, 62) receiving audio output signals corresponding to the first one of two pairs of audio signals. (App. page 11, lines 9-25.) A proxy audio signal component 72 (Figs 2 and 3) coupled to the outputs 90, 92 provides to a second pair of the audio speakers (e.g., speakers 64, 66) a pair of distinct proxy audio output signals whenever the inputs receive only the first one of two pairs of audio input signals. (App. page 13, lines 1-19.)

d. Concise Explanation of the Subject Matter of Independent Claim 11

Referring to Figs. 2 and 3, independent claim 11 recites a four-channel multimedia computer speaker system 50 that includes four inputs 80, 82 that are connectable to receive four distinct audio input signals from an audio sub-system control circuit 54 of a multimedia computer 52. (App. page 11, lines 9-14.) Four outputs 90, 92 are connectable to four separately positionable audio speakers 60-66. (App. page 11, lines 14-17.)

Couplings between a first pair 80 of the inputs and a first pair 90 of the outputs deliver to the first pair 90 of outputs audio input signals received at the first pair 80 of inputs. (See Fig. 3, connection between inputs 80 and outputs 90, and App., page 13, lines 1-3.) A proxy audio signal component 72 is selectively coupled to a second pair 92 of the outputs to provide thereto a pair of distinct proxy audio output signals that are generated from the audio input signals received at the first pair of inputs. (App. page 13, lines 3-5.) A switch element 94 selectively couples the proxy audio signal component to

the second pair of outputs whenever audio input signals are received at only the first pair of inputs. (App. page 16, lines 5-8.)

e. Concise Explanation of the Subject Matter of Independent Claim 23

Referring to Figs. 2 and 3, a four-channel multimedia computer speaker system 50 includes four inputs 80, 82 that are connectable to receive four distinct audio input signals from an audio sub-system control circuit 54 of a multimedia computer 52. (App. page 5 11, lines 9-14.) Outputs 90, 92 are connectable to four separately positionable audio speakers 60-66. (App. page 11, lines 14-17.)

Couplings between a first pair 80 of the inputs and a first pair 90 of the outputs to 10 deliver to the first pair 90 of outputs audio input signals received at the first pair 80 of inputs. (See Fig. 3, connection between inputs 80 and outputs 90, and App., page 13, lines 1-3.) A proxy audio signal component 72 is selectively coupled to a second pair 92 of the outputs to provide thereto a pair of distinct proxy audio output signals that are generated from the audio input signals received at the first pair 80 of inputs. (App. page 15 13, lines 3-5.)

A first two of the four audio input signals include a right front audio signal RSTEREO and a left front audio signal LSTEREO and the pair of distinct proxy audio output signals including a right rear audio signal R'REAR and a left rear audio signal L'REAR, wherein the proxy audio output signals correspond to the right and left front 20 audio signals as follows:

$$R'REAR = RSTEREO - LSTEREO$$

$$L'REAR = LSTEREO - RSTEREO,$$

whenever audio input signals are received at only two of the four inputs. (App. page 13, lines 6-19.)

7. Grounds of Rejection to be Reviewed on Appeal

a. Claims 1-10 stand rejected under 35 USC § 103(a) for obviousness over Holbrook (US Pat. No. 4,612,663) in view of Applicant's prior art.

b. Claims 11-32 stand rejected under 35 USC § 103(a) for obviousness over Cowieson (US Pat. No. 6,198,826) in view of Applicant's prior art.

8. Argument

a. The Rejection of claims 1-10 under 35 USC § 103(a) for obviousness over Holbrook (US Pat. No. 4,612,663) in view of Applicant's prior art should be reversed.

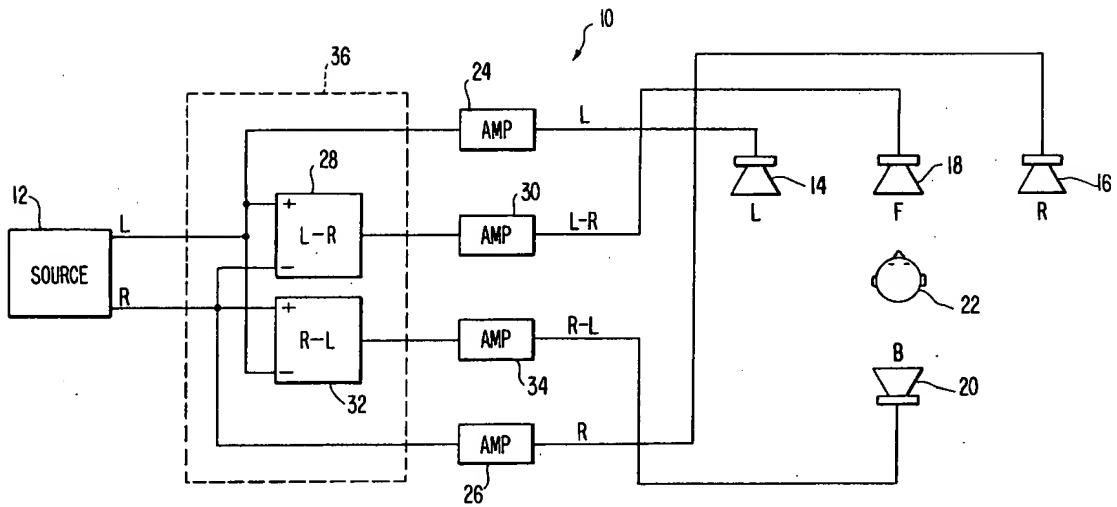
i. Independent Claim 1 is Patentably Distinct from Holbrook

10 Claim 1 recites that the computer speaker system includes two pairs of inputs for receiving from the audio sub-system control circuit at least a first one of two pairs of audio input signals. The two pairs of inputs allow the computer speaker system to receive either two stereo channels or four audio channels from a multimedia computer. Outputs deliver distinct audio output signals to each of four audio speakers, a first pair of the audio speakers receiving audio output signals corresponding to the first one of two pairs of audio signals. A proxy audio signal component coupled to the outputs provides a pair of distinct proxy audio output signals to a second pair of the audio speakers whenever the inputs receive only the first one of two pairs of audio input signals.

 The Examiner cites Holbrook as disclosing each of the features recited in claim 1.

20 Applicant notes that Holbrook describes a computer speaker system that includes only one pair of inputs for receiving from an audio sub-system control circuit only one pair of audio input signals. Holbrook describes a multichannel reproduction system for use with a source providing left (L) and (R) signals (Holbrook, Abstract). Fig. 1 (reproduced below) shows a system that includes only one pair (left and right) of audio inputs.

FIG. 1.



With reference to applicant's prior art disclosure (Fig. 1), the Examiner states that it would have been obvious "to combine the teaching of Holbrook into applicant's prior art 5 to provide a better stereo sound system."

Applicant submits that the combination suggested by the Examiner is improper and the rejection should be reversed because for lack of a teaching or suggestion to make the combination. Fig. 1 of the application shows a prior art four-channel multimedia computer audio system. (App. page 7, lines 18-19.) Holbrook is specifically directed to 10 an "effort to improve on the two-speaker stereo arrangement." (Holbrook, col. 1, line 22.) Applicants submit, therefore, the Holbrook is directed to operation of an audio system with only two-channels, and the prior art audio systems described in the application are directed to an audio system with four-channels. The cited art provides no suggestion that a two-channel audio system would be used to make a four-channel system 15 "better," as proposed by the Examiner, or that a four-channel audio system would be used to modify a two-channel system. The only suggestion to make the combination proposed by the Examiner is with improper hindsight from the present invention. Applicant submits, therefore, that the rejection is improper and should be reversed.

Furthermore, applicant notes that Holbrook provides no teaching or suggestion of 20 providing a pair of distinct proxy audio output signals to a second pair of the audio

speakers whenever the inputs receive only the first one of two pairs of audio input signals. Holbrook describes a system with only one pair of audio inputs. Holbrook provides no teaching or suggestion of two pairs of audio inputs. As a result, Holbrook provides no teaching or suggestion of providing a pair of distinct proxy audio output signals whenever the inputs receive only the first one of two pairs of audio input signals.

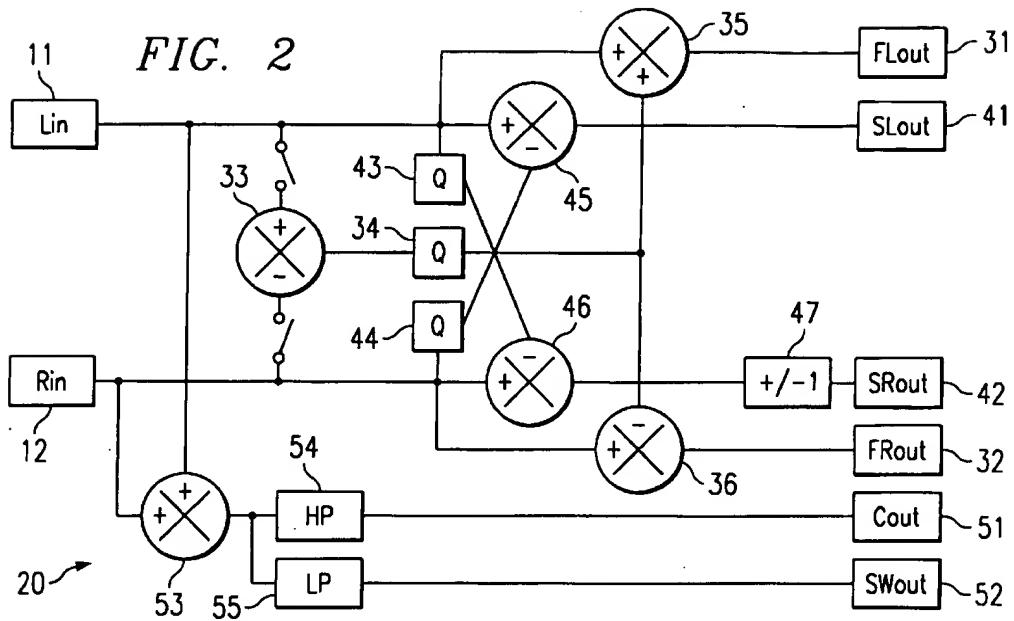
The passage “whenever the inputs receive only the first one of two pairs of audio input signals” states a condition on which the pair of distinct proxy audio output signals are provided. Even if the cited references taught or suggested the input arrangement proposed by the Examiner, none of the references even hints at the claimed condition for providing the proxy audio output signals. The audio signals generated by Holbrook are generated under all circumstances. The prior art does not teach or suggest conditional provision of proxy audio output signals, as recited in claim 1. Applicants submit, therefore, the rejection of claim 1 is improper and should be reversed.

b. The Rejection of claims 11-32 stand rejected under 35 USC § 103(a) for obviousness over Cowieson (US Pat. No. 6,198,826) in view of Applicants' prior art should be reversed.

i. Independent Claim 11 is Patentably Distinct from Cowieson

Independent claim 11 specifically recites four inputs that are connectable to receive four distinct audio input signals from an audio sub-system control circuit of a multimedia computer, and that the proxy audio signal component is provided to the outputs whenever audio input signals are received at only two of the four inputs. Claim 11 further recites a switch element that selectively couples the proxy audio signal component to the outputs.

The Examiner cites Cowieson as disclosing each of the features recited in claim 11. Applicant notes that Cowieson describes a computer speaker system that includes only one pair of inputs for receiving from an audio sub-system control circuit only one pair of audio input signals. Cowieson describes a system the “produces multiple output signals from a two-channel stereo input signal” (Cowieson, Abstract). Fig. 2 (reproduced below) shows a system that includes only one pair (left and right) of audio inputs.



With reference to applicant's prior art disclosure (Fig. 1), the Examiner states that it would have been obvious "to combine the teaching of Cowieson into applicant's prior art 5 to provide a better stereo sound system."

Applicant submits that the combination suggested by the Examiner is improper and the rejection should be reversed because for lack of a teaching or suggestion to make the combination. Fig. 1 of the application shows a prior art four-channel multimedia computer audio system. (App. page 7, lines 18-19.) Cowieson is specifically directed to 10 producing "multiple output signals from a two-channel stereo input signal." (Cowieson, Abstract.) Applicants submit, therefore, the Cowieson is directed to operation of an audio system with only two-channels, and the prior art audio systems described in the application are directed to an audio system with four-channels. The cited art provides no suggestion that a two-channel audio system would be used to make a four-channel system 15 "better," as proposed by the Examiner, or that a four-channel audio system would be used to modify a two-channel system. The only suggestion to make the combination proposed by the Examiner is with improper hindsight from the present invention. Applicant submits, therefore, that the rejection is improper and should be reversed.

Moreover, applicant notes that Cowieson provides no teaching or suggestion of a proxy audio signal component that is selectively coupled to a second pair of the outputs by a switch element whenever audio input signals are received at only the first pair of inputs. Cowieson describes a system with only one pair of audio inputs. Cowieson 5 provides no teaching or suggestion of two pairs of audio inputs. As a result, Cowieson provides no teaching or suggestion of providing a pair of distinct proxy audio output signals whenever the inputs receive only the first one of two pairs of audio input signals.

The passage “whenever the inputs receive only the first one of two pairs of audio input signals” states a condition on which the pair of distinct proxy audio output signals 10 are provided. Even if the cited references taught or suggested the input arrangement proposed by the Examiner, none of the references even hints at the claimed condition for providing the proxy audio output signals. The prior art does not teach or suggest conditional provision of proxy audio output signals, as recited in claim 11. Applicant submits, therefore, the rejection of claim 11 is improper and should be reversed.

15 Furthermore, applicant notes that Cowieson provides no teaching or suggestion of a switch element that selectively couples the proxy audio signal component to the second pair of outputs whenever audio input signals are received at only the first pair of inputs. The Examiner cites switch 47 in Cowieson (Fig. 2) as corresponding to the switch element recited in claim 11. Applicant notes, however, that switch 47 is described as “a 20 user selectable phase inverter following the output of summer 46, which allows the user to turn off the expansion effect of the circuit of FIG. 4.” (Cowieson, col. 43, lines 44-46.) Applicant submits that the operation of switch 47 from Cowieson does not teach or suggest the selective coupling of the proxy audio signal component to the second pair of outputs whenever audio input signals are received at only the first pair of inputs, as 25 recited in the claim. Applicant submits again that the rejection of claim 11 is improper and should be reversed.

ii. Independent Claim 23 is Patentably Distinct from Cowieson

Independent claim 23 specifically recites four inputs that are connectable to receive four distinct audio input signals from an audio sub-system control circuit of a

multimedia computer, and that the proxy audio signal component is provided to the outputs whenever audio input signals are received at only two of the four inputs

The Examiner cites Cowieson as disclosing each of the features recited in claim 23. Applicant notes that Cowieson describes a computer speaker system that includes 5 only one pair of inputs for receiving from an audio sub-system control circuit only one pair of audio input signals. Cowieson describes a system the "produces multiple output signals from a two-channel stereo input signal" (Cowieson, Abstract). Fig. 2 (reproduced above) shows a system that includes only one pair (left and right) of audio inputs. With 10 reference to applicant's prior art disclosure (Fig. 1), the Examiner states that it would have been obvious "to combine the teaching of Cowieson into applicant's prior art to provide a better stereo sound system."

Applicant submits that the combination suggested by the Examiner is improper and the rejection should be reversed because for lack of a teaching or suggestion to make the combination. Fig. 1 of the application shows a prior art four-channel multimedia 15 computer audio system. (App. page 7, lines 18-19.) Cowieson is specifically directed to producing "multiple output signals from a two-channel stereo input signal." (Cowieson, Abstract.) Applicants submit, therefore, the Cowieson is directed to operation of an audio system with only two-channels, and the prior art audio systems described in the application are directed to an audio system with four-channels. The cited art provides no 20 suggestion that a two-channel audio system would be used to make a four-channel system "better," as proposed by the Examiner, or that a four-channel audio system would be used to modify a two-channel system. The only suggestion to make the combination proposed by the Examiner is with improper hindsight from the present invention. Applicant submits, therefore, that the rejection is improper and should be reversed.

25 Moreover, applicant notes that Cowieson provides no teaching or suggestion of a proxy audio signal component that provides a pair of distinct proxy audio output signals, right rear audio signal R'REAR and left rear audio signal L'REAR, whenever audio input signals are received at only two of the four inputs, the proxy audio output signals corresponding to the right front audio signal RSTEREO and the left front audio signal 30 LSTEREO as follows:

R'REAR = RSTEREO - LSTEREO

L'REAR = LSTEREO - RSTEREO.

5 Cowieson describes a system with only one pair of audio inputs. Cowieson provides no teaching or suggestion of two pairs of audio inputs. As a result, Cowieson provides no teaching or suggestion of providing the recited pair of proxy audio output signals whenever the inputs receive only the first one of two pairs of audio input signals.

10 The passage "whenever audio input signals are received at only two of the four inputs" states a condition on which the proxy audio output signals are provided. Even if the cited references taught or suggested the input arrangement proposed by the Examiner, none of the references even hints at the claimed condition for providing the specified proxy audio output signals. The prior art does not teach or suggest conditional provision of proxy audio output signals, as recited in claim 23. Applicant submits, therefore, the rejection of claim 23 is improper and should be reversed.

15 **9. Summary**

In view of the foregoing, appellant submits that the Examiner's rejections of claims 1-11 and 13-32 are improper, and reversal of all of the rejections is respectfully requested.

Respectfully submitted,

20 ipsolon llp

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10. Appendix A: The Claims Involved in the Appeal

1. A universal four-channel multimedia computer speaker system connectable to an audio sub-system control circuit of a multimedia computer, comprising:

four separately positionable audio speakers;

5 two pairs of inputs for receiving from the audio sub-system control circuit at least a first one of two pairs of audio input signals;

outputs for delivering distinct audio output signals to each of the four audio speakers, a first pair of the audio speakers receiving audio output signals corresponding to the first one of two pairs of audio signals; and

10 a proxy audio signal component coupled to the outputs to provide to a second pair of the audio speakers a pair of distinct proxy audio output signals whenever the inputs receive only the first one of two pairs of audio input signals.

2. The computer speaker system of claim 1 in which the second pair of the audio speakers receive audio output signals corresponding to the second one of the two pairs of

15 audio input signals whenever the inputs receive both the first and second pairs of audio input signals.

3. The computer speaker system of claim 1 further comprising a housing that supports the inputs and outputs and encloses the proxy audio signal component.

4. The computer speaker system of claim 3 in which the housing further encloses 20 one of the four audio speakers.

5. The computer speaker system of claim 3 in which the housing further encloses none of the audio speakers of the computer speaker system.

6. The computer speaker system of claim 1 further comprising a sub-woofer speaker that is within a sub-woofer housing and receives a sub-woofer audio signal, the 25 sub-woofer housing supporting the inputs and outputs and enclosing the proxy audio signal component.

7. The computer speaker system of claim 1 in which the pair of distinct proxy audio output signals are generated from the first one of two pairs of audio input signals.

8. The computer speaker system of claim 7 in which the pair of distinct proxy audio output signals include inverse differences of the first one of two pairs of audio input signals.

9. The computer speaker system of claim 7 in which the first one of two pairs of 5 audio input signals includes a right front audio signal RSTEREO and a left front audio signal LSTEREO and the pair of distinct proxy audio output signals includes a right rear audio signal R'REAR and a left rear audio signal L'REAR, wherein the proxy audio output signals correspond to the right and left front audio signals as follows:

$$R'REAR = RSTEREO - LSTEREO$$

10 $L'REAR = LSTEREO - RSTEREO.$

10. The computer speaker system of claim 1 further comprising a bandpass filter that bandpass filters the pair of distinct proxy audio output signals.

11. A four-channel multimedia computer speaker system, comprising:

four inputs connectable to receive four distinct audio input signals from an audio 15 sub-system control circuit of a multimedia computer;

four outputs connectable to four separately positionable audio speakers;
couplings between a first pair of the inputs and a first pair of the outputs to deliver to the first pair of outputs audio input signals received at the first pair of inputs;

20 a proxy audio signal component selectively coupled to a second pair of the outputs to provide thereto a pair of distinct proxy audio output signals that are generated from the audio input signals received at the first pair of inputs; and

a switch element that selectively couples the proxy audio signal component to the second pair of outputs whenever audio input signals are received at only the first pair of inputs.

25 12. (Cancelled)

13. The computer speaker system of claim 11 in which the switch element is manually operable by a user.

14. The computer speaker system of claim 11 in which the switch element is operates automatically according to which inputs are connected to receive audio input signals from an audio sub-system control circuit.

15. The computer speaker system of claim 11 further comprising a housing that
5 supports the inputs and outputs and encloses the proxy audio signal component.

16. The computer speaker system of claim 15 in which the housing further encloses one of the four audio speakers.

17. The computer speaker system of claim 15 in which the housing further encloses none of the audio speakers of the computer speaker system.

10 18. The computer speaker system of claim 11 further comprising a sub-woofer speaker that is within a sub-woofer housing and receives a sub-woofer audio signal, the sub-woofer housing supporting the inputs and outputs and enclosing the proxy audio signal component.

19. The computer speaker system of claim 11 in which the pair of distinct proxy
15 audio output signals are generated from a first two of the four audio input signals.

20. The computer speaker system of claim 19 in which the pair of distinct proxy audio output signals include inverse differences of the first two of the four audio input signals.

21. The computer speaker system of claim 19 in which the first two of the four
20 audio input signals include a right front audio signal RSTEREO and a left front audio signal LSTEREO and the pair of distinct proxy audio output signals includes a right rear audio signal R'REAR and a left rear audio signal L'REAR, wherein the proxy audio output signals correspond to the right and left front audio signals as follows:

$$R'REAR = RSTEREO - LSTEREO$$

25 $L'REAR = LSTEREO - RSTEREO.$

22. The computer speaker system of claim 11 further comprising a bandpass filter that bandpass filters the pair of distinct proxy audio output signals.

23. A four-channel multimedia computer speaker system, comprising:

four inputs connectable to receive four distinct audio input signals from an audio sub-system control circuit of a multimedia computer;

outputs connectable to four separately positionable audio speakers;

5 couplings between a first pair of the inputs and a first pair of the outputs to deliver to the first pair of outputs audio input signals received at the first pair of inputs;

 a proxy audio signal component selectively coupled to a second pair of the outputs to provide thereto a pair of distinct proxy audio output signals that are generated from the audio input signals received at the first pair of inputs; and

10 a first two of the four audio input signals including a right front audio signal RSTEREO and a left front audio signal LSTEREO and the pair of distinct proxy audio output signals including a right rear audio signal R'REAR and a left rear audio signal L'REAR, wherein the proxy audio output signals correspond to the right and left front audio signals as follows:

15 $R'REAR = RSTEREO - LSTEREO$

$L'REAR = LSTEREO - RSTEREO,$

 whenever audio input signals are received at only two of the four inputs.

24. The computer speaker system of claim 23 further comprising a switch element that selectively couples the proxy audio signal component to the outputs.

20 25. The computer speaker system of claim 23 in which the switch element is manually operable by a user.

 26. The computer speaker system of claim 23 in which the switch element is operates automatically according to which inputs are connected to receive audio input signals from an audio sub-system control circuit.

25 27. The computer speaker system of claim 23 further comprising a housing that supports the inputs and outputs and encloses the proxy audio signal component.

28. The computer speaker system of claim 27 in which the housing further encloses one of the four audio speakers.

29. The computer speaker system of claim 27 in which the housing further encloses none of the audio speakers of the computer speaker system.

5 30. The computer speaker system of claim 23 further comprising a sub-woofer speaker that is within a sub-woofer housing and receives a sub-woofer audio signal, the sub-woofer housing supporting the inputs and outputs and enclosing the proxy audio signal component.

10 31. The computer speaker system of claim 23 in which the pair of distinct proxy audio output signals are generated from a first two of the four audio input signals.

 32. The computer speaker system of claim 31 in which the pair of distinct proxy audio output signals include inverse differences of the first two of the four audio input signals.